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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/878,259	06/11/2001	Peter Dreyer	70139	2978

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McGLEW AND TUTTLE, P.C.
SCARBOROUGH STATION
SCARBOROUGH, NY 10510-0827

EXAMINER	
LEE, SHUN K	

ART UNIT	PAPER NUMBER
2878	

DATE MAILED: 03/03/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/878,259	DREYER ET AL.	
	Examiner	Art Unit	
	Shun Lee	2878	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *20 November 2003 and 16 December 2003*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1,4,11 and 13-27* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,4,11 and 13-27* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *11 June 2001* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *1103,1203*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Objections

1. Claims 1, 11, 20, and 21 are objected to because of the following informalities:

(a) in claim 1, "the first and second group of gases" on line 16 should probably be --the first and second plurality of gases--;

(b) in claim 11, "a first group of gases" on lines 19-20 should probably be --said first group of gases--;

(c) in claim 20, "know quantity" on line 13 should probably be --known concentration-- (see specification, pg. 7, lines 14-16);

(d) in claim 20, "the know quantity" on line 14 should probably be --the known concentration--;

(e) in claim 20, "the known quantity" on line 17 should probably be --the known concentration--; and

(f) in claim 21, "circuit" on line 2 should probably be --circuit.-- (*i.e.*, each claim begins with a capital letter and ends with a period; see MPEP § 608.01(m)).

Appropriate correction is required.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

3. Claim 19 is rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which

was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. First it should be noted that it is known in the art that concentration, optical path length, and absorption coefficient determine the quantity of radiation absorbed (see Beer's Law, $\exp(-\alpha CL)$, where α is absorption coefficient, C is concentration, and L is path length; *e.g.*, column 10, lines 16-28 of Eckstrom). The specification discloses (first three paragraphs on pg. 12) that agreeing absorption behavior is achieved when L_{CO2} = 7 mm and $L_{halothane}$ = 46 mm for the example of activation cross section $\alpha_{CO2} = 1.81X10^{-2}$ (mm vol. %)$^{-1}$, C_{CO2} = 3 vol. %, activation cross section $\alpha_{halothane} = 8.627X10^{-3}$ (mm vol. %)$^{-1}$, and $C_{halothane}$ = 1 vol. % (note that $\alpha_{CO2}C_{CO2}L_{CO2} = 0.4$ and $\alpha_{halothane}C_{halothane}L_{halothane} = 0.4$ and thus according to Beer's Law have agreeing absorption behavior). Claim 19 recites the limitation "said first and second optical paths having lengths to cause absorption coefficients of the radiation from said first and second radiation sources to be substantially identical". However, the specification fails to describe the relationship between "absorption coefficients" and "absorption behavior" and the functional dependence of "absorption coefficients" on optical paths lengths .

4. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

5. Claims 11 and 13-18 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 11 recites the limitation "the multispectral detector" in line 27. The antecedent basis for this limitation in the claim is unclear (*i.e.*, is the antecedent basis "the first multispectral detector" or "the second multispectral detector").

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

7. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

8. Claims 1, 11, 13-18, and 20-27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Dreyer (US 5,942,755) in view of Eckstrom (US 5,747,809), Passaro *et al.* (US 4,423,739), and Braig *et al.* (US 5,296,706).

In regard to claim **1**, Dreyer discloses (column 1, line 28 to column 2, line 30; Fig.) an infrared optical gas analyzer, comprising:

(a) an infrared optical radiation source arrangement (1, 2, 3) comprises a first (1) and a second (2) infrared optical radiation source;

(b) a first multispectral detector (5, 11);

(c) a second multispectral detector (5, 10); and

(d) a cuvette (4) containing the gas mixture to be measured, said infrared optical radiation source (1, 2, 3) positioned such that the radiation emitted in a first wavelength range (*e.g.*, 2.5 to 4.3 μm; column 1, lines 47-50) reaches the first multispectral detector (5, 11) through the interior space of the cuvette (4) and radiation emitted in a second wavelength range (*e.g.*, 7.5 to 14 μm; column 1, lines 47-50) reaches the second multispectral detector (5, 10) through the interior space of the cuvette (4), said first wavelength range and said second wavelength range being selected such that they will be different from one another (*e.g.*, 2.5 to 4.3 μm and 7.5 to 14 μm; column 1, lines 47-50), said first wavelength range including absoption wavelengths for a first plurality of gases (*e.g.*, CO_2 and N_2O; column 1, lines 47-57; column 2, lines 15-21; column 3, lines 6-65), said second wavelength range including absorption wavelengths for a second plurality of gases (*e.g.*, gaseous anesthetics; column 1, lines 47-57; column 2, lines 15-21; column 3, lines 6-65).

While Dreyer also discloses (column 1, lines 47-50; column 3, lines 6-65) that concentrations of the first and second plurality of gases are determined using radiation signals from the first and second detectors, the analyzer of Dreyer lacks an explicit description of an evaluation unit for determining the concentrations, wherein the

evaluation unit uses the radiation signals from both the first and second detectors to determine the concentration of two of the gases in the first and second plurality of gases having a cross sensitivity in the first and second wavelength ranges. However, evaluation units for calculating values for the gas concentrations are well known in the art. For example, Eckstrom teaches (column 10, lines 40-45) that standard methods of computer (*i.e.*, evaluation unit) analysis are used to calculate values for the gas concentrations (using Beer's Law; column 10, lines 16-28) and (column 10, line 46 to column 11, line 36) that in the first (or second) gas group concentration calculations, the evaluating and control unit can automatically compensate the multispectral detector cross sensitivities to the second (or first) gas group by using the second (or first) wavelength range radiation signals (*i.e.*, previously established calibration curves) for the correction of the first (or second) wavelength range radiation signals (*i.e.*, crosstalk corrections). As another example, Passaro *et al.* teach (column 3, lines 13-59; column 3, lines 13-59) that cross-talk compensation is used to correct for spectral interference. As a further example, Braig *et al.* teach (column 15, line 29 to column 16, line 28) to correct for cross-talk between channels (*i.e.*, different detectors) using calibration methods known in the art. In addition, it should be noted that radiant intensity decaying exponentially with path length and attenuation coefficient is a relationship known in the prior art as the Bouguer, Lambert, or Beer Law, or some hyphenated combination of these three. Therefore it would have been obvious to one having ordinary skill in the art at the time of the invention to provide a conventional computer in the analyzer of Dreyer, in order to more accurately determine gas sample ingredient concentrations

using standard computer analysis methods (*i.e.*, using Bouguer-Lambert-Beer law including crosstalk corrections with previously established calibration curves) to correct for spectral interference when measuring with one or more detectors.

In regard to claims **11** and **13** in so far as understood, Dreyer in view of Eckstrom, Passaro *et al.*, and Braig *et al.* is applied as in claim 1 above. Dreyer also discloses (column 1, line 28 to column 2, line 30; Fig.) that the process for determining gas concentrations with an infrared optical gas analyzer further comprising the steps of: determining the concentrations of a first group of gases (*e.g.*, CO_2 and N_2O; column 1, lines 47-57) contained in the gas mixture from the signals of the radiation in the first wavelength range (*e.g.*, 2.5 to 4.3 μm; column 1, lines 47-50), which are received by the first multispectral detector (5, 11); and determining the concentrations of a second group of gases (*e.g.*, gaseous anesthetics; column 1, lines 47-50) contained in the gas mixture from the signals of the radiation in the second wavelength range (*e.g.*, 7.5 to 14 μm; column 1, lines 47-57), which are received by the second multispectral detector (5, 10).

In regard to claims **20** and **26**, Dreyer in view of Eckstrom, Passaro *et al.*, and Braig *et al.* is applied as in claims 11 and 13 above. Dreyer also discloses that said first and second wavelength ranges are separate (*e.g.*, 2.5 to 4.3 μm and 7.5 to 14 μm; column 1, lines 47-50).

In regard to claim **14** (which is dependent on claim 11) and claim **22** (which is dependent on claim 20), Dreyer also discloses that the first group of gases includes one

of the gases carbon dioxide, laughing gas and methane (*e.g.*, CO_2 and N_2O; column 1, lines 47-57).

In regard to claim **15** (which is dependent on claim 11) and claim **23** (which is dependent on claim 20), while Dreyer also discloses (column 1, lines 47-50) that the second group of gases includes one of the gaseous anesthetics, the process of Dreyer lacks an explicit description that the gaseous anesthetics is desflurane, enflurane, halothane, isoflurane or sevoflurane. However, gaseous anesthetics are well known in the art. For example, Braig *et al.* teach (column 1, lines 49-55) that some of the most common gaseous anesthetics are desflurane, halothane, isoflurane and sivoflurane. Therefore it would have been obvious to one having ordinary skill in the art at the time of the invention that the gaseous anesthetics in the process of Dreyer is one of the common gaseous anesthetics such as halothane.

In regard to claim **16** (which is dependent on claim 11) and claim **24** (which is dependent on claim 20), Dreyer also discloses (column 1, lines 47-50) that the first wavelength range is 2.5 to 4.3 μm (*i.e.*, approx. from 3 μm to 5 μm).

In regard to claim **17** (which is dependent on claim 11) and claim **25** (which is dependent on claim 20), Dreyer also discloses (column 1, lines 47-57) that the second wavelength range is 7.5 to 14 μm (*i.e.*, approx. from 8 μm to 11 μm).

In regard to claim **18** which is dependent on claim 14, Dreyer is applied as in claims 15-17 above.

In regard to claim **21** which is dependent on claim 20, Dreyer also discloses (column 1, lines 53-57) that the gas mixture is from an anesthetic breathing circuit.

In regard to claim **27** which is dependent on claim 21, Dreyer is applied as in claims 22-26 above.

9. Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Dreyer (US 5,942,755) in view of Eckstrom (US 5,747,809), Passaro *et al.* (US 4,423,739), and Braig *et al.* (US 5,296,706) as applied to claim 1 above, and further in view of Miyazaki *et al.* (US 5,689,114).

In regard to claim **4** which is dependent on claim 1, the analyzer of Dreyer lacks that the radiation emitted by the first and second infrared optical radiation source travels over a path of different length (*e.g.*, paths at right angle to each other). However, unequal path lengths are well known in the art. For example, Miyazaki *et al.* teach (column 3, lines 48-56; column 4, lines 52-63) that unequal path lengths allow the concentration of various ingredients in the sample gas to be measured with high sensitivity and that longitudinal and lateral (*i.e.*, orthogonal) paths allow rapid introduction and stabilization of a gas sample in a sample cell. Therefore it would have been obvious to one having ordinary skill in the art at the time of the invention to provide unequal path lengths (*e.g.*, orthogonal paths) in the analyzer of Dreyer, in order to rapidly introduce and stabilize a gas sample in the sample cell so as to obtain high sensitivity measurements of various gas sample ingredient concentrations.

Response to Arguments

10. Applicant's arguments filed 20 November 2003 have been fully considered but they are not persuasive.

In response to applicant's arguments (first paragarph on pg. 12 of remarks filed 20 November 2003) against the references individually, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986).

In response to applicant's argument (second paragarph on pg. 12 of remarks filed 20 November 2003) that the different cells of Eckstrom cannot be modified to the single cell of Dreyer, the test for obviousness is not whether the features of a secondary reference may be bodily incorporated into the structure of the primary reference; nor is it that the claimed invention must be expressly suggested in any one or all of the references. Rather, the test is what the combined teachings of the references would have suggested to those of ordinary skill in the art. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981). It should be noted that Eckstrom teaches (column 10, line 46 to column 11, line 36) that in the first (or second) gas group concentration calculations, the evaluating and control unit can automatically compensate the multispectral detector cross sensitivities to the second (or first) gas group by using the second (or first) wavelength range radiation signals for the correction of the first (or second) wavelength range radiation signals (*i.e.*, crosstalk corrections). In this case, it is important to recognize that Eckstrom teaches gas concentration calculations (with crosstalk corrections). Therefore it would have been obvious to one having ordinary skill in the art at the time of the invention to provide improved gas concentration calculations (*i.e.*,

crosstalk corrections) in the analyzer of Dreyer, in order to obtain a gas concentration which is corrected for crosstalk.

In response to applicant's argument (first two paragraphs on pg. 13 of remarks filed 20 November 2003) that the references fail to show certain features of applicant's invention, it is noted that the features upon which applicant relies (*i.e.*, first and second wavelength ranges do not overlap and a specific composition of the first and second group of gases) are not recited in the rejected claim(s). Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993). It should be noted that amended independent claim 1 recites the limitation "said first wavelength range and said second wavelength range being selected such that they will be different from one another" and amended independent claim 11 recites the limitation "selecting said first wavelength range and said second wavelength range such that they will be different from one another". Thus the first and second wavelength ranges are different (*i.e.*, not the same). Moreover, Eckstrom teaches (column 10, line 65 to column 11, line 36) that crosstalk corrections are used to correct overlap of absorption bands. Thus, it is important to recognize that absorption bands are different than the first and second wavelength ranges recited in the claims (*i.e.*, overlapping absorption bands do not require overlapping first and second wavelength ranges).

In response to applicant's argument (third paragarph on pg. 14 of remarks filed 20 November 2003) that the gas constantly flows in Dreyer (with the figure cited as support) whereas the gas of Miyazaki *et al.* is static, the test for obviousness is not

whether the features of a secondary reference may be bodily incorporated into the structure of the primary reference; nor is it that the claimed invention must be expressly suggested in any one or all of the references. Rather, the test is what the combined teachings of the references would have suggested to those of ordinary skill in the art. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981). Applicant argues that the gas constantly flows in Dreyer. Examiner respectfully disagrees. First it should also be noted that Miyazaki *et al.* state (column 5, lines 31-34) that "Also, in this embodiment, for example, assuming that a sample gas is an exhalation, explanations will be provided for a case where $^{12}CO_2$ and $^{13}CO_2$ concentrations in the exhalation are measured". Thus Miyazaki *et al.* measure exhalations. In addition, gas constantly flowing is not inherent in the figure of Dreyer. Furthermore, Dreyer states (column 1, lines 55-57) that "The second infrared radiation source may be used to measure the concentrations of CO_2 and N_2O in the respiratory flow resolved for individual breaths". Individual breaths is inhaling and exhaling. Thus it is clear that the gas flows in one direction, stops, and flows in the opposite direction for each individual breath.

Applicant argues (first paragarph on pg. 15 of remarks filed 20 November 2003) that a person of ordinary skill in the art would not be led to Miyazaki from Dreyer since Miyazaki *et al.* teaches the advantages of one lamp, and Dreyer teaches two different lamps. Examiner respectfully disagrees. Miyazaki *et al.* states (column 3, lines 33-36) that "When the gas analyzing apparatus has a common power source for detection light sources for the plurality of detection means, error values in the detection means

resulting from power source noise can coincide with each other". Thus it is clear that Miyazaki *et al.* teach two (or more) light sources.

Applicant argues (second paragarph on pg. 15 of remarks filed 20 November 2003) that Miyazaki *et al.* further cannot lead a person to modify Dreyer since Miyazaki *et al.* cannot operate fast enough to perform measurements with every breath of a patient. Examiner respectfully disagrees. Dreyer states (column 1, lines 55-57) that "The second infrared radiation source may be used to measure the concentrations of CO_2 and N_2O in the respiratory flow resolved for individual breaths". The key phrase is "may be used". Thus Dreyer suggests operation at speeds up to a rate wherein individual breaths are resolved. Moreover, applicant does not provide any explanation (or evidence) of the maximum speed of Miyazaki *et al.*'s invention.

Conclusion

11. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. US Patent 6,219,138 (Swanson *et al.*) discloses (column 1, lines 16-30) that radiant intensity decaying exponentially with path length and attenuation coefficient is a relationship known in the prior art as the Bouguer, Lambert, or Beer Law, or some hyphenated combination of these three.

12. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

13. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Shun Lee whose telephone number is (571) 272-2439. The examiner can normally be reached on Monday-Thursday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Porta can be reached on (571) 272-2444. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

DAVID PORTA
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2800

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